

R E M A R K S

Reconsideration of this application, as amended, is respectfully requested.

THE SPECIFICATION

The specification has been amended to replace the term "excited light" with the more correct term "exciting light," as well as to make a few minor grammatical improvements. No new matter has been added, and it is respectfully requested that the amendments to the specification be approved and entered, and that the objection to the specification be withdrawn.

THE CLAIMS

Independent claims 1, 5-7 and 9 have been amended to recite that the solid imaging device of the present invention includes a plurality of photoelectric elements, as already recited in independent claims 8 and 10.

In addition, independent claims 1 and 5-10 have been amended to clarify that a transparent conductive layer is provided in the solid imaging device between the DNA probes and the plurality of photoelectric elements, and that a voltage is applied to the transparent conductive layer to attract a nucleotide strand, as supported by the disclosure in the specification at, for example, page 30, line 17 to page 31, line 10, and Figs. 3 and 4B.

Still further, the claims have been amended to make some minor grammatical improvements and to correct some minor antecedent basis problems, as well as to correct all of the indefinite recitations pointed out by the Examiner in item 6 of the Office Action.

No new matter has been added, and it is respectfully submitted that the amended claims are in full compliance with the requirements of 35 USC 112, second paragraph.

Accordingly, it is respectfully requested that the amendments to the claims be approved and entered, and and it is respectfully requested that the rejection under 35 USC 112, second paragraph, be withdrawn.

THE PRIOR ART REJECTION

Claims 1-13, 16 and 17 were all rejected under 35 USC 102 and/or 35 USC 103 as either being anticipated by USP 5,846,708 ("Hollis et al"), or as being obvious in view of Hollis et al, taken singly or in combination with one or more of USP 5,381,028 ("Iwasa"), USP 4,889,974 ("Auding et al"), USP 5,182,662 ("Mihara"), USP 5,468,606 ("Bogart et al"), USP 4,746,622 ("Hawkins et al"), and USP 5,843,655 ("McGall et al"). These rejections, however, are respectfully traversed with respect to the claims as amended hereinabove.

According to the claimed present invention as recited in each of amended independent claims 1 and 5-10, an optical DNA sensor is provided which comprises a solid imaging device having a plurality of photoelectric elements, and a transparent conductive layer provided between a plurality of DNA probes and the plurality of photoelectric elements and to which a voltage is applied to attract a nucleotide strand. With this structure, the transparent conductive layer provides an attraction force, so that improved hybridization can be performed. In addition, the transparent conductive layer allows light emitted from hybridized DNA probes to pass through to reach the photoelectric elements.

Hollis et al, by contrast, merely discloses a structure in which a CCD gate electrode 220 is made of a metal such as tantalum or tungsten. It is respectfully submitted, however, that Hollis et al does not disclose, teach or suggest applying a voltage to the CCD gate electrode 220 to attract a nucleotide strand, and that Hollis et al does not disclose, teach or suggest that the CCD gate electrode 220 is transparent.

Accordingly, it is respectfully submitted that the present invention as recited in each of amended independent claims 1 and 5-10 clearly patentably distinguishes over Hollis et al under 35 USC 102.

With respect to the secondary references, moreover, it is respectfully submitted that Iwasa, Auding et al, Mihara, Bogart

et al, and McGall et al all clearly also fail to disclose, teach or suggest a transparent conductive layer provided between a plurality of DNA probes and a plurality of photoelectric elements and to which a voltage is applied to attract a nucleotide strand, as according to the claimed present invention.

Hawkins et al discloses at column 14, lines 15-31 that a CCD may be formed by means of low-temperature formation or selective patterning using metals, amorphous or polycrystalline silicon, low temperature silicon dioxide, silicon nitride and the like. In this connection, it is noted that metals are conductors, that amorphous or polycrystalline silicon are semiconductors, and that silicon dioxide and silicon nitride are insulators. Therefore, it is respectfully submitted that a person of ordinary skill in the art would understand that the polycrystalline silicon of Hawkins et al corresponds to a part to generate an electric charge in a CCD, i.e. wafer 212 of Hollis et al, which generates charge 223 when light enters (see Fig. 15 of Hawkins et al). It is respectfully submitted, however, that Hawkins et al does not disclose, teach or suggest that the polycrystalline silicone corresponds to an electrode. Hawkins et al does disclose "amorphous silicon" or "polycrystalline silicone," but amorphous silicon cannot be used as an electrode because of its low electron mobility, and instead is used as a semiconductor which generates electric charge by light. Logically, even when

polycrystalline silicone is used, the relevant part is intended to work as semiconductor. Therefore, it is respectfully submitted that Hawkins et al does not disclose, teach or suggest a transparent electrode on a light-entering side, and that even if the teachings of Hollis et al and Hawkins et al were combinable in the manner suggested by the Examiner, the result would be merely to replace the gate electrode 220 of Hollis et al with the metals of Hawkins et al. And it is respectfully submitted that Hawkins et al does not disclose, teach or suggest a transparent conductive layer provided between a plurality of DNA probes and a plurality of photoelectric elements and to which a voltage is applied to attract a nucleotide strand, as according to the claimed present invention.

In view of the foregoing, it is respectfully submitted that the present invention as recited in amended independent claims 1 and 5-10, as well as claims 4, 11-13, and 17 respectively depending therefrom, clearly patentably distinguishes over all of the cited references, taken singly or in any combination consistent with the respective fair teachings thereof, under 35 USC 102 as well as under 35 USC 103.

* * * * *

Entry of this Amendment, allowance of the claims and the passing of this application to issue are respectfully solicited.

Application Serial No. 10/534,368
Response to Office Action

Customer No. 01933

If the Examiner has any comments, questions, objections or recommendations, the Examiner is invited to telephone the undersigned at the telephone number given below for prompt action.

Respectfully submitted,

/Douglas Holtz/

Douglas Holtz
Reg. No. 33,902

Frishauf, Holtz, Goodman & Chick, P.C.
220 Fifth Avenue - 16th Floor
New York, New York 10001-7708
Tel. No. (212) 319-4900
Fax No. (212) 319-5101

DH:iv:jkr
encs.